In this work we deal with cluster analysis for functional data. Functional data contain a set of subjects that are characterized by repeated measurements of a variable. Based on these measurements we want to split the subjects into groups (clusters). The subjects in a single cluster should be similar and differ from subjects in the other clusters. The first approach we use is the reduction of data dimension followed by the clustering method K-means. The second approach is to use a finite mixture of normal linear mixed models. We estimate parameters of the model by maximum likelihood using the EM algorithm. Throughout the work we apply all described procedures to real meteorological data.